spores received from Antibes in his laboratory at Halle and partly by Strasburger who had studied the species in the Mediterranean. The anatomy and formation of the spores had been previously published by Woronin in the Annales des Sciences. To this De Bary adds an account of a peculiar process connected with the base of the plant. The spores produce a number of zoöspores which conjugate by twos or by larger numbers. Zoöspores from the same sporangium do not conjugate with one another but only with those coming from another sporangium. W. G. F.

8. *Entwickelungsgeschichte des Prothalliums von Gymnogramme leptophylla ;* by Dr. KARL GOEBEL. Inaugural Dissertation. Strasbourg, 1877.—A detailed account of the growth of the prothallus of *Gymnogramme leptophylla.* The antheridia are like those of *Aneimia hirta.* The archegonia originate in a peculiar process, which projects from the under side of the prothallus. If the archegonia are not fertilized, the process grows into a new prothallus. The prothallus is also propagated by means of a kind of adventitious buds so that a single protballus may live for several months and attain a considerable size. W. G. F.

9. *On a new Species of Parasitic Green Alga belonging to the genus Chlorochytrium of Cohn ;* and *On a species of Rhizophydium parasitic on Species of Ectocarpus, with notes on the Fructification of the Ectocarpi ;* by Prof. EDWARD PERCEVAL WRIGHT. Dublin Trans. R. I. Acad., vol. xxvi.—The species of *Chlorochytrium* was found by Prof. Wright on several plants, among others on *Calothrix confervicola*, where it was probably seen by Harvey and mistaken by him for the spores of that plant. The *Rhizophydium* as shown by Prof. Wright's plate seems to be the parasite which is very common on *Ectocarpi* of our own coast. At the end of the second article is a consideration of the different forms of sporangia found in British species of *Ectocarpus.* W. G. F.

10. *Transpiration in Plants.*—In the last number of this Journal, attention was called to a recent paper by Wiesner, showing that the rays of light which correspond to the absorption bands of the chlorophyll spectrum, are the most efficient in transpiration. Dehérain (in Ann. des Sci. Nat. for Sept., 1877) reviews Wiesner's communication and states that in 1869 he arrived, by a different method of experimenting, at an opposite result, namely, that yellow light is more active than blue in transpiration. Still claiming that his method is free from errors, he submits the following explanation of the contradiction: the rays which determine transpiration are the ones absorbed by chlorophyll, but they effect transpiration proportionately to their own convertible energy ; it may therefore be supposed that a yellow ray, richer in calorific radiation, can act with greater energy, although only partly absorbed by chlorophyll, than can a blue ray, poor in calorific radiations, which is more completely absorbed. G. L. G.

11. *On Japanese Lingula and Shell Mounds.*—At a meeting of the Boston Society of Natural History, December 19, Professor EDWARD S. MORSE communicated some of the results of his work

in Japan. His main object in visiting Japan was to study more fully a group of animals upon which he has been at work for a long time—the Brachiopoda.

Accepting an appointment as professor of Zoology in the Imperial University of Tokio he established a Zoological station on the coast for the purpose of collecting material for the University Museum and for the training of Japanese assistants in the work.

His studies of Lingula have brought out many points new to science. The discovery of auditory capsules in the class of Brachiopods is one of the most important. These organs he determined in a species of Lingula and their position and general appearance recall the auditory capsules as figured by Claparède in certain tubicolous Annelids. He has also cleared up many of the obscure points in regard to the circulation, and is prepared to maintain the absence of anything like a pulsatory organ, the circulation being entirely due to ciliary action. Mr. Morse also described some of the habits of Lingula. While partially buried in the sand the anterior border of the pallial membranes contract in such a way as to leave three large oval openings, one in the center and one on each side. The bristles which are quite long in this region of the animal arrange themselves in such a way as to continue these openings into funnels and entangle the mucous which escapes from the animal; these funnels have firm walls. A continual current is seen passing down the side funnels and escaping by the central one.

They bury themselves very quickly in the sand, and the peduncle agglutinates a sand tube. They attach themselves by means of this tube to the bottom of dishes in which they are confined.

Mr. Morse exhibited living specimens of Lingula which he had brought from Japan in a small glass jar. The water had only been changed twice since August 20th, and yet no specimen had died. This illustrated more fully the vitality of Lingula than the experiments he had made on the North Carolina Lingula several years since.

A description was also given of an ancient shell-mound discovered by Professor Morse at Omori near Tokio, and photographs of many of the vessels exhumed were exhibited. The general aspects of the deposit were like those described by Steenstrup in Denmark, and by Wyman, Putnam and others on the United States coast. The implements were mostly horn. Only three rude stone implements were discovered. The pottery was remarkable in showing a great variety of ornamentation, though it was very rude in character and did not exhibit that finish seen in ancient Corean pottery which is found in the Empire. In the incised character of the markings it recalls the pottery of the east coast of the United States.

In the character of the raised knobs for handles on the edge of the vessels it shows the closest resemblance to pottery discovered by Professor Hartt in Brazil. Mr. Morse was not prepared to say whether it was early Aino or a race which preceded the Ainos and which the Ainos displaced in their occupation of the island from the north.